EXECUTIVE SECRETARIAT

Routing Slip

TO:		ACTION	INFO	DATE	INITIAL
1	DCI				
2	DDCI				
3	EXDIR				
4	D/ICS				
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6	DDA				
7	DDO				
8	DDS&T				
9	Chm/NIC				
10	GC				
11	IG				
12	Compt				
13	D/EEO				
14	D/Pers				
15	D/OEA				
16	C/PAD/OEA				
17	SA/IA				
18	AO/DCI				
19	C/IPD/OIS				
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	SUSPENSE				

Date

Remarks:

[redacted]

Executive Secretary

3637 (10-81)

Date

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THE WHITE HOUSE
WASHINGTON

Executive Registry
82-13932

CABINET AFFAIRS STAFFING MEMORANDUM

DATE: 11/16/82 NUMBER: 077625CA DUE BY: COB 12/3, 82

SUBJECT: CCCT: Research and Development (CM323)

	ACTION	FYI
ALL CABINET MEMBERS	☑	☐
Vice President	☐	☐
State	☐	☐
Treasury	☐	☐
Defense	☐	☐
Attorney General	☐	☐
Interior	☐	☐
Agriculture	☐	☐
Commerce	☐	☐
Labor	☐	☐
HHS	☐	☐
HUD	☐	☐
Transportation	☐	☐
Energy	☐	☐
Education	☐	☐
Counsellor	☐	☐
OMB	☐	☐
CIA	☐	☐
UN	☐	☐
USTR	☐	☐
CEA	☑	☐
CEQ	☐	☐
OSTP	☐	☑
_____	☐	☐
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	ACTION	FYI
Baker	☐	☑
Deaver	☐	☑
Clark	☑	☐
Darman *(For WH Staffing)*	☑	☐
Harper	☑	☐
Jenkins	☐	☐
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CCCT/Gunn	☐	☑
CCEA/Porter	☐	☐
CCFA/Boggs	☐	☐
CCHR/Carleson	☐	☐
CCLP/Uhlmann	☐	☐
CCMA/Bledsoe	☐	☐
CCNRE/Boggs	☐	☐

REMARKS: Please review and provide comments by COB 12/3/82

RETURN TO:

☐ Craig L. Fuller
Assistant to the President
for Cabinet Affairs
456-2823

☑ Becky Norton Dunlop
Director, Office of
Cabinet Affairs
456-2800

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20500

U.S. RESEARCH AND DEVELOPMENT

The Issue:

Is U.S. research and development, both federal and industrial, adequate in quality, quantity, and direction to permit this nation to respond to high-technology challenges from abroad?

Background:

High-technology industries are perceived increasingly as a major source of economic growth and new jobs, not only by the United States but by Japan, Western Europe, and even by many of the developing nations. In addition, high-technology is essential to our defense, traditionally offering us the means to counter the numerical superiority of Soviet forces.

Prior to the decade of the 1970's, U.S. preeminence in science and in its application, technology, was essentially unchallenged. Recently, competition in the marketplace for consumer electronics, semiconductor components, air frames, robots, etc., as well as in high-technology manufacturing processes challenges our leadership. The most serious threat comes from Japan, where high-technology products and processes have fueled their rapid industrial growth. But Western Europe falls closely behind with Taiwan and even South Korea promising to join the front ranks in the future. The success of the United States in developing, following World War II, the world's greatest science enterprise and in applying it to industry has been an example for other nations to emulate.

Numerous discussions have focussed upon foreign industrial and trade policies that threaten free trade and the ability of nations such as ours, that espouse free enterprise, to compete successfully. The ability of the U.S. to respond to the new challenge to many of our traditionally stronger industries has also been raised, and the strength and vitality of our research

and development (R&D) enterprise is an important indicator of the future competitiveness of our high-technology industries. Not to be overlooked is the rapid improvement in Soviet military technology, challenging U.S. military capability on the ground, the sea, and in the air.

To retain perspective, overall U.S. leadership in R&D cannot be questioned. The total investment in R&D, both federal and industrial, equals the combined investment of Japan, West Germany, France, and the U.K. But as recently as 1970, we invested twice as much as did those same nations. So the threat arises from the relative rates of growth as well as from the ability to benefit from the investment in R&D.

The R&D picture in the United States is also changing rapidly, in response to the new competitive challenge. Although federal, non-military R&D has not been keeping pace with inflation, industrial R&D has been growing rapidly, nearly 16% for all U.S. industries in 1981, in spite of the economic climate. In addition, military R&D has grown substantially under the Reagan Administration, benefiting U.S. industry. The growth in industrial R&D, prompted by the intense international competition, began before the Reagan Administration and continues to grow even more rapidly. But to better understand the overall position of the U.S. in R&D, it is necessary to take a careful look at the nature of our R&D, its strengths as well as its weaknesses.

U.S. Research and Development:

Research and development span basic research, the pursuit of new knowledge, to development and demonstration, the pursuit of new products and new manufacturing processes. Basic research has traditionally been supported almost entirely by the federal government whereas development and demonstration are largely the purview of industry, except where the government is the customer, as in defense. Between basic research and development lies applied research, an area whose support is shared by government and industry. The development of modern electronics may serve to exemplify these essential distinctions. Breakthroughs in the fundamental understanding of the nature of solids, and semiconducting metals in particular, occurred through federally funded basic research carried out over many years in U.S. universities and federal laboratories. It

prompted the invention, at Bell Laboratories, of the transistor. In turn, this application of knowledge to a new technology led to the computer as well as a vast scope of consumer, industrial, and defense related electronics.

Since World War II, the majority of the new knowledge that has served as the fuel for high-technology and technology-dependent industries was discovered in the United States. In addition to examples such as the transistor, laser, and the new biotechnology, further testimony to U.S. preeminence in basic science can be found in the distribution of Nobel Prizes; in the 1970's, nearly 70% of all Nobel award winning research was performed in the U.S. But our competitors have become better and better at introducing the fruits of new knowledge to the marketplace and, perhaps even more important, in improving the product and the processes for manufacturing it. In many areas of high-technology, considerations of product quality and price offer foreign industries an advantage.

If today our source of new knowledge remains strong but our ability to apply it challenged, then what avenues for improvement are available? The Cabinet Council on Commerce and Trade is examining trade policy, tax policy, and anti-trust and patent policies to identify unilateral burdens, if they exist, as well as potential federal stimuli to increased private sector investment in R&D. In particular, cooperative industrial R&D ventures may well need to be less constrained to permit diverse U.S. industries to compete with foreign government-industrial partnerships. Tax incentives, introduced under the Economic Recovery Tax Act (ERTA) have proved to benefit capital-intensive industries through provisions for accelerated capital depreciation while the benefit to high-technology industries has not yet been clearly demonstrated.

The intrinsic leverage of direct, federal R&D, also needs careful scrutiny. In the post-Sputnik era. the federal R&D investment grew markedly but its ability to serve clearly defined national needs has waned as priorities have changed and direction from government has languished. An intensive effort to address U.S. energy security following the 1973 Arab oil embargo served to further exacerbate the situation. A strong consensus exists, both in government and industry, that closer direction and better utilization of the federally

supported talent and facilities must be accomplished in order to meet the new challenges to our industry and defense.

In the first half of the Reagan Administration, action was taken to encourage industrial R&D, e.g. the ERTA, patent and anti-trust policies, and to work more closely with industry in directing and carrying out federal R&D. Efforts to create stronger industry-university partnerships and to force research in federal laboratories into better alignment with the needs of industry have begun, but are by no means accomplished. The objective has been to add the "pull" of industry to the "push" of government. There exists strong evidence that this movement is accelerating. For example, industrial investment in academic research will likely double in 1982 and 1983 over previous years. In addition to better direction, the Reagan Administration has sought to emphasize basic research, the source of new knowledge as well as new engineers and scientists, while reducing government involvement in the marketplace through development and demonstration activities, such as in synthetic fuel demonstration plants.

As the FY-84 federal budget evolves, the pressing question pertaining to the allocation of funds to R&D is whether existing policy should be maintained, accelerated, or altered to respond to new public emphasis on R&D, as espoused by the "Atari Democrats," who suggest massive increases in federal R&D to support eonomic growth and new jobs.

Summary:

The U.S. R&D enterprise leads the world in both quality and quantity, but this leadership is facing a new challenge. Trade, tax, as well as anti-trust and patent policies are being examined for their ability to stimulate more private sector investment in R&D. U.S. industrial investment in R&D is growing rapidly, nearly 16% in 1981, and exceeded the federal investment for the first time in 1980. Efforts to direct the federal R&D investment to serve better the long-term needs of industry and defense are underway. Among the means being used are promotion of stronger industry-university partnerships and redirection of research in federal laboratories. In allocating public funds, emphasis has

been placed upon basic research, the source of new knowledge and new talent, while funds for near-term development and demonstration, where industry's investment is expanding rapidly, has been diminished. While basic and defense related research has been increasing modestly, the overall federal investment in non-military R&D has been decreasing relative to inflation. Although demands of the market appear to be stimulating applied research and development in U.S. industry, basic research remains nearly totally in the hands of the federal government. This traditional bastion of the U.S. R&D enterprise, consuming slightly more than 25% of the total federal investment in non-military R&D, has long been the source of our qualitative superiority.

Options:

The basic options that are under consideration during preparation of the FY-84 budget will include:

1. Maintaining modest growth in basic research, while continuing to reduce support for development and near-term applied research activities.

2. Introducing substantial increases (5-10% real growth) in basic research, emphasizing those disciplines most likely to benefit industry and defense as well as the training of new scientists and engineers, while continuing to reduce support for development and near-term applied research.

3. Substantially increasing all civilian R&D, encompassing basic and applied research as well as development, to assist U.S. industry in meeting the challenge from abroad in high-technology.